IARC Impact in practice series
The Spain experience

Since becoming an IARC Participating State in 2003, **Spain has transformed long-standing scientific collaboration into a strategic partnership that delivers both national public health value and international influence**. Through IARC, Spain does not simply access global cancer science; it helps shape it. Membership gives Spain a voice in IARC governance and a practical advantage at home: access to independent evidence, harmonised methods, and international benchmarks that help a decentralised health system improve prevention, strengthen screening, and address regional inequalities more effectively.

Why IARC membership made the difference for Spain:

- **Scientific leadership at scale:** Spain is among IARC's most active collaborators, with nearly 1,000 joint publications in the past decade, concentrated in high-impact, data-intensive fields such as genome-wide association studies, nutrition and obesity, metabolomics, HPV and cervical cancer, screening and colonoscopy, and occupational and environmental risks. This positions Spanish centres at the core of multinational consortia where robust evidence depends on pooled datasets, shared protocols, and coordinated analysis.
- **Evidence used across government:** IARC research is embedded in Spanish policymaking. Almost 400 official policy and technical documents cite IARC evidence, supporting cancer screening strategies, health technology assessment, surveillance, and prevention policies across national institutions and regional health authorities.
- **Implementation support that improves system performance:** The partnership increasingly moves beyond evidence generation to evidence in practice. A clear example is the region-by-region analysis of colorectal cancer screening programmes, using questionnaires including the essential and desirable criteria of organised screening programmes identified by international experts in a Delphi study coordinated by IARC.
- **Capacity and standards that remain in Spain:** Spain has built a strong and lasting training relationship with IARC, with competitive fellowships dating back to 1967 and 33 early-career visiting scientists during 2021–2025. This pipeline has been reinforced through dedicated postdoctoral placements with return support, helping ensure that expertise comes back into Spanish institutions. At the same time, Spanish experts contribute directly to IARC's global standards - including *IARC Monographs* - ensuring that Spain helps shape the guidance it uses nationally.

Part I. Scientific leadership through international collaboration

Exceptional intensity and depth of collaboration

Spain has been one of IARC's longest-standing and most deeply integrated scientific partners. Since joining IARC in 2003, collaboration between Spanish institutions and IARC has grown into a mature, high-intensity partnership spanning epidemiology, prevention, screening, and large-scale cohort research. Over the last decade alone, Spanish researchers have co-authored **984 scientific publications with IARC, averaging nearly 100 joint papers per year**[1], placing Spain among the IARC's most active collaborators globally.

This collaboration is characterised not only by volume, but by exceptional international integration. **38% of these publications are IARC-led**,

Cancer in Spain: a substantial burden with strong potential for prevention

Based on recent Globocan estimates cancer remains a major public health challenge in Spain, with **close to 300,000 new cases each year** and one of the highest absolute cancer burdens in Europe. Colorectal, breast, lung, and prostate cancers account for a large share of cases, reflecting both continued exposure to modifiable risk factors and, where applicable, participation to organised screening. Despite improving survival, cancer remains a leading cause of premature death. Spain's national cancer strategy, aligned with **Europe's Beating Cancer Plan**, prioritises prevention, early detection, and high-quality care, supported by population registries and established screening programmes. However, regional inequalities in participation in screening and persistent lifestyle-related risks underline the need for strong, evidence-based prevention policies.

[1] Data derived from Web of Science records of IARC–Spain co-authored papers published between January 2016 and January 2026.

reflecting Spain's embedded participation in large, coordinated, multicountry research infrastructures. The scale of collaboration per paper is striking: IARC-linked publications involve a **median of 27 institutions**, compared with **7 institutions** for Spanish oncology papers that do not involve IARC, demonstrating a nearly fourfold increase in collaborative depth when IARC is engaged. In total, partners span **1,900+ institutions across 180 countries**, positioning Spanish centres at the heart of global cancer research networks.

Web of Science micro-topic analysis shows that Spain-IARC outputs are strongly concentrated in large-scale, data-intensive fields, led by **Genome-wide Association Studies, Nutrition & Obesity, and metabolomics**, with additional clusters in **HPV and cervical cancer, screening disparities and colonoscopy, genetic testing, and epigenetic regulation**. This pattern indicates a partnership focused not on dispersed topics but on population-scale cohorts, prevention research, and molecular epidemiology, where harmonised data and multinational coordination are essential.

Box #2: Quantifying the impact of obesity on cancer risk at population scale

Through collaboration with IARC, Spanish researchers have helped produce **some of** the largest real-world studies ever conducted on obesity and cancer risk. Analyses involving **more than 2.6 million Catalan adults** and a **prospective cohort of 3.5 million adults across Spain** have shown how body mass index and waist circumference are linked to the risk of multiple cancer types.

These studies do more than confirm obesity as a risk factor: they quantify its impact at population scale, using routine health data and long-term follow-up to show how excess weight shapes cancer risk across the life course. This gives Spain robust, nationally relevant evidence to inform policies on **nutrition, physical activity, healthy weight, and cancer prevention**.

By turning large-scale health data into actionable public health evidence, Spain is not only strengthening its own prevention strategies, but also contributing to the international scientific basis for cancer control.

➔ **Leadership in European and global research infrastructure**

Through IARC, Spanish institutions are **at the forefront of some of the world's largest cancer research infrastructures**, contributing data, expertise, and leadership while benefiting from shared platforms that enable analyses at global scale.

A flagship example is the **EPIC (European Prospective Investigation into Cancer and Nutrition)**: one of the largest long-term cohort studies worldwide on diet, lifestyle, and cancer risk. In Spain, EPIC spans five regions (Asturias, Basque Country/Gipuzkoa, Navarra, Murcia, and Andalucía/Granada) and includes **over 41,000 participants**, nearly **39,900 of whom provided biological samples** for biomarker research. With decades of follow-up through cancer registries and mortality data, EPIC provides a uniquely powerful resource to understand how nutrition, lifestyle, and metabolism influence cancer risk over time.

Beyond EPIC, Spanish centres are embedded in multiple IARC-coordinated international platforms tackling major public health risks:

- **International Nuclear Workers Study (INWORKS):** evaluates cancer risks from low-dose ionising radiation among nuclear workers, informing occupational safety standards ;
- **Alcohol-Related Cancers and Genetic Susceptibility in Europe (ARCAGE):** examines how alcohol consumption, genetics, and lifestyle interact in cancers of the upper aero-digestive tract ;
- **Human Papillomavirus and Head and Neck Cancer Consortium (HPV-AHEAD):** investigates the role of human papillomavirus infection in head and neck cancers to guide vaccination and prevention strategies ;
- **DISCERN (Discovering the Causes of Three Major Cancers in Europe):** integrates exposomics, genomics, and biobanking to identify environmental and lifestyle determinants of cancer
- **Molecular pathology initiatives**, including lung carcinoid tumour classification projects that combine histopathology and genomics to improve diagnosis and prognosis ;
- **Comprehensive Cancer Infrastructures for Europe:** strengthens research capacity, digital systems, and training across European cancer networks (see part II);
- **BCNet (Biobank and Cohort Building Network):** where the Spanish National Cancer Research Centre (CNIO) contributes to harmonisation, technical support, and global expansion of biobanking and cohort infrastructures.

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➔ Shaping the global cancer research agenda and standards

Spanish experts and diplomats help steer IARC's direction. Through seats on the **Scientific Council and Governing Council**, and active involvement in developing the Medium-Term Strategy (MTS), Spain contributes directly to setting IARC's research and capacity-building priorities. This high-level engagement is a form of **soft power**. By shaping IARC's work programme, Spain brings national and regional realities into global decision-making while gaining early insight into emerging priorities, methods, and partnership opportunities, aligning its own cancer plans and investments with cutting-edge international evidence.

Spain's contribution extends to active leadership in international standard-setting. During the 2020-2025 cycle, **11 Spanish experts have contributed to IARC's Flagships Programmes** including:

- **IARC Monographs Volume 126:** *Opium Consumption*
- **IARC Monographs Volume 130:** *1,1,1-Trichloroethane and Four Other Industrial Chemicals*
- **IARC Monographs Volume 136:** *Talc and Acrylonitrile*
- **IARC Monographs Volume 137:** *Hydrochlorothiazide, Voriconazole, and Tacrolimus*
- **IARC Monographs Volume 138:** *Automotive gasoline and some oxygenated gasoline additives*
- **IARC Monographs Volume 139:** *Hepatitis D Virus, Human Cytomegalovirus, and Merkel Cell Polyomavirus*
- **IARC Handbooks of Cancer Prevention Volume 18:** *Cervical cancer screening*
- **World Health Organization Classification of Tumours (Blue Books) 5th and 6th editions:** Editorial board and expert contributions supporting tumour pathology classification, diagnostic standards, and reporting systems across multiple organ sites.

Part II. From evidence to action: IARC's impact on national Public Health

➔ Evidence that informs national regulation and prevention policy

In Spain, IARC assessments function as **trusted, independent evidence used directly in national guidelines, screening strategies, and technical standards**, supporting more consistent, evidence-based cancer control across the country's decentralised health system. An Overton analysis identified **almost 400 public-sector policy and technical documents citing IARC research** (2000-2026), demonstrating routine use of IARC evaluations across national and regional government decisions. Citations come predominantly from authorities responsible for health planning, screening, and technology assessment, including:

- the **Ministry of Health (Government of Spain)**
- the **Red Española de Agencias de Evaluación de Tecnologías Sanitarias (RedETS)**
- **GuíaSalud** and national clinical guideline bodies
- **regional health authorities** across Andalucía, Cataluña, Madrid, Murcia, Navarra, País Vasco, Galicia, Castilla-La Mancha, Castilla y León, Aragón, Canarias, La Rioja and others.

These bodies reference IARC research to underpin regulatory and preventive action on:

- **Cancer surveillance and planning:** national and regional strategies citing GLOBOCAN estimates to prioritise services and resource allocation
- **Screening policy and programme design:** the **National Health System's common portfolio of services for cancer screening**, which established population-based **colorectal cancer screening for adults aged 50–69 every two years**, drawing on international evidence and IARC-supported analyses of effectiveness and coverage
- **Clinical and technology assessment guidelines:** RedETS and GuíaSalud reports using IARC epidemiological evidence to evaluate the effectiveness, safety, and cost-effectiveness of new diagnostic and treatment technologies
- **Lifestyle and prevention strategies:** policy and technical documents addressing alcohol, obesity, diet, and other modifiable cancer risks

➔ Transforming screening performance and equity

Beyond informing policy documents, IARC collaboration increasingly supports **how programmes are implemented and improved in practice**. Spain's population-based screening programmes for breast, cervical, and colorectal cancers are well established, but important regional inequalities persist in coverage, invitation rates, and participation. Working with IARC scientists, Spanish authorities have conducted systematic, data-driven assessments of programme performance, applying criteria of organised screening programmes to pinpoint where systems fall short (see Box #3). This evolution from research collaboration to hands-on system improvement illustrates the partnership's practical value: not only producing evidence, but **helping translate it into more effective and consistent cancer prevention services nationwide**.

Box #3: From evidence to implementation: improving colorectal cancer screening in Spain

Colorectal cancer is the most commonly diagnosed cancer in Spain and a leading cause of cancer death. To reduce this burden, the Ministry of Health introduced population-based screening - biennial stool blood testing for adults aged 50–69 - with nationwide coverage as a policy goal.

Yet in practice, delivery remained uneven across Spain's decentralised health system. Working with Spanish authorities and responding to demand from national stakeholders, IARC supported a **region-by-region analysis of programme performance**. Using internationaly recognized essential and desirable criteria of organised screening programmes, the assessment exposed major gaps, especially in the information system and quality assurance dimensions.

As **Dr Isabel Mosquera Metcalfe**, project principal investigator at IARC, noted, **"The project can help to systematically identify areas for improvement in the regional colorectal cancer screening programmes, and then, regions can take concrete actions to address them."**

This collaboration moved beyond training to **hands-on implementation support**: benchmarking services, identifying organisational bottlenecks, and providing a credible basis for targeted action. As Dr Mosquera Metcalfe observed, **"if we can translate these analyses into action, the potential impact for cancer screening in Spain could be significant."** By generating comparable, independent evidence, IARC supports authorities to strengthen programmes, and improve equity and efficiency.

➔ A European multiplier for evidence-based cancer policy

Across the European Union, IARC acts as a **multiplier of national efforts**, turning scientific evidence into coordinated action at scale. An Overton analysis (2005-2026) identified **over 500 EU policy and technical documents** citing IARC research, demonstrating that IARC evaluations are routinely used by EU institutions and agencies to inform legislation, guidance, and public health strategies.

IARC Europe-wide analyses directly shape policy choices and guidance, for example, work showing that recent increases in prostate cancer incidence in Europe are likely driven by PSA testing patterns (with implications for screening approaches), comparative burden estimates for Europe (millions of new cancer cases and deaths annually), and major studies mapping socioeconomic inequalities in cancer mortality to inform targeted cancer control.

IARC also produces actionable modelling, showing that scaling up tobacco control could prevent one in four lung cancer cases in Europe (about **1.65 million fewer cases over 20 years**), and supports implementation through initiatives such as EU-funded implementation research such as **EU Joint Action on the implementation of cancer screening programmes (EUCanScreen)**, which sets common standards for screening delivery and quality assurance and **EUROHELICAN**, assessing the feasibility of population-based *H. pylori* test-and-treat strategies for gastric cancer prevention. In parallel, IARC remains a core technical partner in efforts to improve the quality, comparability and timeliness of cancer registry data and to refine indicators used in the **European Cancer Information System (ECIS)** and the **European Cancer Inequalities Registry (ECIR)**.

Together, this body of evidence feeds into the **European Code Against Cancer (ECAC)**, which converts evidence into clear, practical prevention recommendations for governments and citizens across Europe. In Andalucía, Spanish partners piloted delivery of the European Code Against Cancer through **mobile phone text messages**, testing whether brief, low-cost SMS prompts could increase awareness of cancer prevention behaviours. This approach demonstrates how evidence-based guidance can be communicated at scale through simple digital tools, helping reach populations who may not engage with traditional health promotion channels and making prevention advice more accessible in everyday life.

IARC also strengthens Europe's prevention ecosystem by convening and supporting major collaborative platforms, such as **Cancer Mission Europe** and **Cancer Prevention Europe** (including its Learning Centre), that accelerate translation of evidence into capacity building and practice across Member States.

By combining independent evidence, harmonised methods, and implementation support, IARC enables Participating States to **benchmark performance, share best practices, and adopt proven prevention strategies faster and more efficiently** than acting alone. For Spain, this collaboration provides not only access to data and expertise, but a seat at the table where **European and global cancer control standards are defined**.

Part III. Building capacity for lasting impact

➔ Training and institutional partnership as a multiplier of national capacity

Spain's collaboration with IARC extends beyond individual research projects to long-term capacity building at both institutional and human levels. A **Memorandum of Agreement with the Spanish National Cancer Research Centre (CNIO/Instituto de Salud Carlos III)** formalises sustained cooperation, facilitating joint projects, data sharing, and closer alignment between national priorities and IARC's global research agenda.

Training and knowledge exchange complement this foundation. Spain has maintained a continuous presence in IARC's fellowship programmes for nearly six decades, with **nine Spanish researchers awarded competitive IARC fellowships since 1967.** More recently, between 2021 and 2025, **33 Spanish early-career visiting scientists** trained at IARC , gaining advanced skills in epidemiology, data science, and multicountry research coordination. Spain has also established a dedicated pathway to sustain this pipeline, funding **two 2-year postdoctoral fellowships at IARC**, combined with return grants to reintegrate fellows into Spanish institutions.

This engagement is part of IARC's wider capacity-building ecosystem, which includes the Postdoctoral Fellowship Programme, the IARC Summer School, the IARC Learning Platform, and global networks for cancer registries, screening, and biobanking. Together, these initiatives train thousands of professionals worldwide and generate durable benefits: in a 2024 outcome survey, **98% of postdoctoral respondents reported transferable skills, 72% maintained research ties with IARC after training, and over half progressed to leadership roles (53%) or managed independent research funding (52%)**. This creates a **two-way multiplier effect**: expertise gained at IARC is reinvested in national institutions, while the priorities, data, and methodological strengths of participating countries feed back into IARC's networks, helping shape future research, standards, and capacity-building efforts.